Jos. Hartshorne M.D.

from the Author.

(Morton (S. G.)

INTRODUCTORY LECTURE

TO

A COURSE

OF

DEMONSTRATIVE ANATOMY;

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BY

SAMUEL GEORGE MORTON, M.D.

Lecturer on Anatomy; Physician to the Philadelphia Alms-House Infirmary; Member of the Medical Societies of Philadelphia and Edinburgh,— of the College of Physicians and Surgeons of the University of New York,—of the American Philosophical Society,—of the Academy of Natural Sciences of Philadelphia, &c.

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INTRODUCTORY LECTURE.

The human body is an obvious and tangible miracle; it presents us with a great variety of organs, differing widely in appearance and function, yet possessing, in health, an astonishing harmony of action.

I can conceive of nothing in nature so perfect as man in the meridian of life; when the offices of vitality are unimpaired, when the intellect is in full vigor, and the varied faculties of mind and matter are yet untouched by age or disease. "What a piece of work is man!" exclaims the great dramatist: "How noble in reason! How infinite in faculties! In form and moving how express and admirable! In action how like an angel! In apprehension how like a god! The beauty of the world—the paragon of animals!"

Such is the human fabric in the strength of manhood; but it is an appalling truth that this unequalled structure will be inevitably subjected to the inroads of disease, or the slow but consuming canker of age. The heart ceases to beat; the nerves become insensible; the eye that once possessed the glance of the eagle, can see no longer; the mouth is dumb, and the ear cannot hear. This is called Death. The transition from one of these stages to the other is often surprisingly rapid, and effected by seemingly inadequate means. A hair accidentally lodged in the organs of respiration, can in a moment suspend all the multifarious springs of existence.—A blood vessel is opened, and life gushes out at the wound. On the contrary, a repletion of the vital fluid is itself the harbinger of dissolution, and man sinks in apoplectic unconsciousness.

What the sages tell us, experience verifies; neither beauty, talents nor power, afford any reservation in favor of the possessor; and he who gazes on the fascinating features of the ball room, or the embellished crowd of the theatre, may in some degree realize the feelings of Xerxes, when he soliloquized on those whom his ambition had led into Greece:

"In a hundred years, not one of this multitude will have remained upon the earth!"

Death abolishes the distinctions which custom has introduced into society: the dead body of the slave differs not from that of his master; each displays, in an equal degree, the work of a superior intelligence, constantly inviting our research, but often eluding our scrutiny.

To this ultimate stage of human organization, society has ever attached a kind of sacred feeling. Among the ancients, superstition placed an almost insuperable barrier in the path of the anatomist; and while thousands of lives were recklessly sacrificed to the purposes of ambition, the disciples of Hippocrates could scarcely procure one dead body to promote the healing art, and the cause of humanity. The slain lay in heaps on the field of battle, but superstitious usage forbade the approach of the anatomist.

The ancient Egyptians embalmed their dead, and deposited them in the sepulchres of Thebes and Antinoë: the Greeks and Romans consumed the inanimate body with fire, and preserved the ashes in an urn.* The Jews considered it pollution to touch a corpse except in preparing it for sepulture. The Saracens cherished similar feelings; for Abdolaliph, their celebrated anatomist, led his pupils to the burying grounds of Cordova, and there taught them Osteology from the shattered fragments which the spade of the grave digger had thrown upon the surface.

Even Aristotle, sustained as he was by the patronage of Alexander, confined his dissections almost exclusively to the inferior orders of animals; and the Anatomy of Hippocrates, the father of medicine, has little value beyond the simple bounds of Osteology. Hippocrates† is believed to have been the first writer on Anatomy; and it is an interesting fact,

* The Greeks, on one or two occasions, condemned their victorious generals to death, because they left their countrymen unburied on the scene of conflict. What punishment then—asks a celebrated author—what punishment would they have inflicted on the man who had dared to violate their tombs!

Even the Roman physicians, says Galen, performed the voyage to Alexandria to see a skeleton.

† 400 years before the Christian æra.

that the first recorded dissection of a human body was made by his friend Democritus of Abdera. I well recollect an observation of Professor Wistar's made many years ago to his class: "He must indeed have been a bold spirit who performed the first dissection; and history awards this honor to Democritus, the Abderian." The minute descriptions given by Homer, of the wounds received by the heroes of the Iliad, prove him to have been well versed in some points of Anatomy; and yet, as human dissections were unknown in his time, it is presumed that he obtained his knowledge from the examination of brutes.

The first government which authorized the appropriation of the dead to anatomical uses, was that of Egypt under the Ptolemies: hence the school of Alexandria acquired a pre-eminence which it retained for many centuries. To have studied at this school, says Ammianus, was a certain passport to credit and confidence.

Notwithstanding the obstacles to demonstrative anatomy in Greece and Italy, it was even in those countries considered absolutely indispensable to the healing art. "It is altogether necessary"—says Celsus—"to examine the bodies of the dead for the purpose of studying the internal organs." The practice of *Herophilus and Erasistratus—he adds—was still more desirable; for they took malefactors from the prisons, and dissected them alive: and, while they yet breathed the breath of life, examined the position, colour, size, form, and other circumstances connected with the visceral organs. Nor can it be considered cruel, as some assert, to commit a few offenders to dissection, inasmuch as the good, for ages to come, will be benefited by the sacrifice."†

This sentiment of the Roman physician is justly appalling to our modern sensibility, and is indeed prohibited by the commonest principles of humanity. Anatomists of the present day ask no such immolations: they are content to examine the inanimate body; or, where living nature is demanded for peculiar investigations, the brute alone is sacrificed.

* 300 years before Christ.

† Lib. 1. I am aware that some authors deny the truth of this assertion of Celsus; but the question is yet undecided.

But I have neither design nor intention to enter into the history of Anatomy : were I to do so it would not be difficult to show, that anatomists of modern times have had to contend with the same prejudices which were encountered by their brethren of antiquity. Le Gendre, a French writer of the last century, observes, that the dissection of a dead body was accounted sacrilege even so lately as the reign of Francis the first. The same author declares that he witnessed a consultation held by the divines of Salamanca, at the request of Charles the fifth, to determine the question—whether or no it were lawful, in point of conscience, to dissect a human body in order to become acquainted with its structure.*

This circumstance need not surprise us : a moment's observation will convince any one, that the objections to practical anatomy have experienced but a partial abatement in more modern times. Some of the most enlightened nations of Europe deny even a tacit acquiescence in the dissection of paupers, who have been a burthen to the community during their lives, and who have none to mourn over them in death. The lazar houses of all countries are crowded with such characters, upon whose remains, (at least when the feelings of friends and kindred are not violated,) society has a just and imperative claim. Disregard this claim and what will be the inevitable consequence? The tomb will be despoiled of its shrouded inhabitants.

The history of dissection in Scotland, affords a practical comment on the preceding observations : the Scots are as vehement against this practice, as if they suspected it might interfere with the final resurrection of the body. Yet notwithstanding this circumstance, a few persevering teachers succeeded, towards the close of the last century, in rendering Edinburgh the first anatomical school in Europe. In truth, had it not been for the zeal and talents of the professors of Anatomy, Edinburgh would have now been, in medical matters, on a level with Aberdeen or St. Andrews. No one denies this ; and yet the Scots have in no degree relaxed their crusade against this science.

* Encyclop. Art. Anatomy.

Far am I from disregarding that hallowed sentiment which attaches the living to the dead, and gives sanctity to the tomb. It should not be deemed a prejudice, inasmuch as it is true to nature, and ennobling to the heart. That individual is indeed unenviable who cherishes no such feelings, and who is callous and indifferent to the *remains* of those whom he loved, or should have loved, while living. But this is sacred ground; suffice it to aver, that the art of the anatomist calls not for its violation.

But the man who would throw every possible difficulty in the path of the anatomist,—who would restrict this noble science to books and drawings, and heap odium on its cultivators, must indeed be possessed of a narrow and uncharitable spirit. He would sacrifice practical good to abstract feelings; and shield the dead body from the knife, while thousands linger in the agonies of appalling diseases, the cure of which is dependant on exact anatomical knowledge. Vindictive feelings should never be indulged; but were such a man laboring with stone in the bladder, or the rupture of an intestine, inflexible justice might commit him to the merciless operations of an ignorant surgeon.

Were a practitioner to set a broken limb so as to render it deformed and useless, would the community excuse him on the plea of ignorance? Never! The loudest enemies of dissection would be most vehement in his condemnation. They would not pardon, nor even palliate a surgical blunder, at the same time that they withhold the only means that can possibly prevent it.

Anatomy is on all hands acknowledged to be indispensable to the healing art: it may indeed be assumed as a fact, that a man who is ignorant of it is unfit to practise either medicine or surgery: every step he takes will necessarily be in the dark; every prescription will be at random; every cure an accident.

A half educated anatomist is but the fractional part of a physician; for how is it possible for that man to decide on the location of disease, who knows nothing of the structure and relative position of the involved organs? Such ignorance in the practitioner of physic, places him in the pre-

dicament of a tinker, who attempts to restore the delicate members of a shattered watch.

Human anatomy can only be learned by dissecting the human body; and where dissection is efficient and frequent, there will medicine be studied to most advantage. We have seen that it was upon this basis that the school of Alexandria established and maintained its celebrity. The other branches which were taught there are scarcely matter of record.

In our day, Paris is the grand resort of medical students from all parts of the world. What gives it this superiority? I reply—its anatomical advantages. Paris is also, I grant, the focus of new medical doctrines; but no one need go there to learn them, inasmuch as they are perfectly accessible through the medium of books. Again—hypotheses are fluctuating; and it is very questionable if any school could preserve a dominant reputation by the aid of medical doctrines only, were these ever so ingenious.

London, the metropolis of Britain, is so deficient in anatomical advantages, that most of the students who pursue the other branches there, go to Paris for anatomy. It is probable, however, that this difficulty will in some measure vanish under the strenuous efforts of the London University; which already counts a large number of medical pupils, and may yet leave Edinburgh in the rear.

Edinburgh derived its primitive celebrity from the first Monro, who, a century since, was one of the leading anatomists of Europe. His son succeeded him—a man of talents and industry equal to his father, and of such distinguished abilities as a teacher, that towards the close of the last century his class was composed of upwards of five hundred students.

I admit the talents of Dr. Cullen in the practice of Physic, and of Dr. Black in Chemistry; but it was the anatomical school that gave eclat to Edinburgh, and attracted its thousands of pupils. Some may inquire why that school has declined so much of late years? The reason is this: the present incumbent of the anatomical chair, possesses no part of the talents of his predecessors; and of the class professedly attending the medical lectures, it is rare to see one fifth in the anatomical room.

We all know what has elevated our University to its present reputation as a medical school. Without detracting in the least from the merits of those great names which have added to its lustre in other branches, it cannot be denied that its anatomical advantages contribute mainly to its pre-eminence: and I must here avow my opinion, that these advantages, all circumstances considered, are very little, if at all inferior to those of Paris itself. I am free to grant to Paris the greatest anatomical facilities in respect to private dissection; but I am equally convinced that the lectures in the *Ecole de Medicine* are less instructive than those of the University of Pennsylvania. The former are public in every sense of the word, inasmuch as they are incessantly interrupted, and even crowded, by individuals whose sole motive is curiosity.

Again—I never saw in Paris or any where else, the minutiæ of anatomy so splendidly illustrated by *models* as in the University of Pennsylvania. There are many parts of the body which cannot be in any other way demonstrated to a large class: yet have I seen the professors of some foreign schools vainly endeavouring, without these aids, to teach the structure of the brain, the eye and the ear, without rendering the demonstration visible to a tythe of their auditors.

It must be gratefully acknowledged, therefore, that if our anatomical facilities are not quite so great as we could desire, they are nearly equal to those of Paris, and far superior to those of the British islands, and the contemporary schools of our own country. In truth, nothing more is required of the student in this city, than moderate zeal and cheerful industry, to enable him to obtain a competent, and even minute knowledge of anatomy.

There is a kind of anatomy to which I shall for a moment call your attention, more easily accessible than systematic dissection, and not less instructive. I allude to simple *post mortem* examinations: to these the better classes of society will generally accede with cheerfulness, even in the instance of nearest and dearest friends, and especially in those instances where the nature of the disease has been doubtful or

obscure. There can be no doubt that the advantages of this practice would be vastly greater than they now are, if they were more frequently solicited. It would, indeed, be a good general rule, for a physician to examine the bodies of all those who die under his care, provided the consent of connexions can be obtained for that purpose.

Various difficulties, I grant, will follow the prosecution of such a resolve; among which the *time* required is a serious consideration with many: but when we reflect on the great practical advantages which accrue from pathological anatomy, we should consider the time well spent which may be devoted to the pursuit of it. To others there is something repulsive in the prosecution of this subject; whence it happens that they who practise it least are most apt to forego its advantages. Such scruples are unfortunate in a physician, and should be overcome by the habitual use of the knife.

To judge of a human body in a diseased state, it is necessary to be familiar with its appearances in health. In almost every post mortem examination a part of the organs will be found unimpaired; the appearances presented under such circumstances, must be carefully borne in mind, because they are the sole points of comparison in all our pathological investigations. It is obvious, let me repeat, that no one can judge of the morbid conditions of these organs, unless he be previously conversant with their healthy characteristics. Pathological anatomy, observes Laennec, is not to be learned from books; the best treatises are only calculated to embarrass those who do not study nature for themselves. The writings of Bonetus and Morgagni, are a dead letter to him who does not take the knife into his own hand.

Let us therefore avail ourselves of every opportunity to examine the dead body; for if there is any source from which we can reasonably expect to derive unequivocal principles in Medicine, it is this.

There are, however, some circumstances connected with these pursuits to which I beg leave to call your attention. In the first place, it is of inexpressible importance to guard against the premature examination of persons supposed to be dead;

and the most unequivocal symptoms of death should have been many hours present, before dissection is resorted to. What are these symptoms? Of all those circumstances which are said by authors to indicate the extinction of life, no one is unequivocal except incipient decomposition. We cannot draw a positive inference from the glazed eye, the cold and rigid limbs, the pulseless blood vessels, or the absence of respiration. You are all aware, that instances have occurred of persons remaining many hours in what is termed a trance; some have recovered before the rites of sepulture were concluded; others have resuscitated in tombs and vaults, and have lived to be the historians of their own perilous adventures. But some, less fortunate, have revived after inhumation, when all intercourse with the living world above them has been precluded for ever.

These facts should teach us great circumspection; and, as a general rule, an examination should not take place within twenty-four hours of death. Some circumstances connected with climate and disease, will require exceptions to this rule; in which cases the physician must consult his conscientious judgment.

It is the duty of the physician to guard against another practice, which is more likely to do mischief than either premature dissection or interment: I allude to the hasty inclosure of supposed dead bodies in ice. Hired attendants often insist on this step a very short time after apparent death; so soon, indeed, that if any spark of vitality remained, it would be effectually annihilated by the means resorted to to preserve the corpse. This is an appalling reflexion, and demands the watchful interference of the physician whenever occasion presents. A respectable undertaker of this city has assured me, that he has on several occasions, in vain expostulated with the 'layers out of the dead' to prevent the use of ice within two hours after death. Now, it is rare in our climate for obvious decomposition to take place in so short a time, and this, I repeat, is the sole unequivocal criterion of death.

Changing the subject, I will endeavour briefly to put the student of anatomy on his guard against the hypotheses of his art; for where facts are so abundant, theory should be cautiously admitted.

The scrutiny and industry of anatomists, have long since demonstrated the minute structure and uses of most of our organs; but their ultimate arrangement, and the manner in which they perform their functions, are, in many instances at least, mysteries which remain to be unravelled.

Thus, after centuries of indefatigable research, many parts of the human frame continue to be imperfectly understood; and observers even differ among themselves, respecting the arrangement of those structures which can be brought within the sphere of vision. Thus, one observer will insist that the middle coat of an artery is muscular; another denies it: one proves the bones to possess a laminated texture; an opponent controverts it: one describes a set of extreme vessels by the name of exhalents, while their very existence is disputed by many anatomists.

When the powers of the microscope were divulged in Europe, the anatomists of all countries exulted in the discovery, very naturally supposing that the arcana of their science would forthwith be revealed, and all conflicting opinions be merged in simple and unequivocal facts. Alas! how great has been the disappointment! The microscope has established very few questions which might not have been determined without it. Put a microscope into the hands of half a dozen observers, and scarcely two of them will agree in their conclusions. Thus—Lieuenhoeck and many others, tell us that the red particles of the blood are spherical; Hewson declared them to be bladders with a central moving body; the Abbé de la Torre assures us that these bodies are not globules, but rings; while Lister and Hodgkin, among the latest microscopic observers of these protean substances, inform us that they can only compare them to flattened cakes, thickened at the edges.

Such discrepancies are truly humiliating; but as the subjects on which these learned controversies have been raised are of little or no practical importance, the event is far less to be regretted. I have introduced these circumstances to show the occasional poverty of hypothesis, and the necessity there is, for the student of Anatomy to fix his attention on determined facts.

Leaving then the arcana of ultimate structure to the curious, it is for us to pursue Anatomy as an exact science; and to familiarize ourselves with those details which can be tested by the evidence of the senses.

We shall find that Anatomy has an almost boundless range, of which the human body forms but a small portion: it extends its dominion to Beasts and Birds, to Fishes, Reptiles and Insects, and in fact to every description of organized matter. The air, the earth, the ocean, teem with living creatures, each possessing a structure adapted to its peculiar wants, and bearing conviction to the unprejudiced mind, that Chance has done nothing,—Omnipotence every thing—in the ordering of the Universe.

Comparative Anatomy, though forming no part of my present design, may be occasionally resorted to with advantage. An organ which in one animal has but an obscure existence, may possess, in another, so complete a development, as to decide all doubts in respect to its structure and function. Again, there are occasional analogies of organization between man and the inferior animals, which render the latter extremely useful to the student of Anatomy. For example—the brain of the sheep approximates so nearly to that of man, that the one may be advantageously dissected to elucidate the other. The same remark will apply equally to the structure of the heart, of the eye, and of some glandular parts; also to the bones, cartilages, synovial membranes, &c. &c.

The practice, however, which once obtained so generally, of committing living animals to the minute processes of dissection, cannot be too severely reprobated. Notwithstanding the solemn sanction of Vesalius, and of many eminent anatomists of more recent times, it cannot be denied that living dissection is useless barbarity. Can we decide respecting the natural and healthy action of organs, when an animal is excited to the utmost degree by fear and pain? Do not these two causes give rise to a morbid condition, very far removed from health? I grant that it is often important—even indispensable—to test the effects of poisons on brutes before administering them to man; but this process involves little suffering, and

is of short duration. The practice I would abjure, is that of subjecting dumb animals to the progressive grades of minute dissection, until life is extinguished at the altar of science.

If the anatomist—observes Vicq d'Azyr—is resolved to examine living nature, there to seek the solution of some occult problem, how repulsive will be the scene before him! He no longer finds the unbroken quiet which enshrouds the inanimate body: on the contrary the dread and suffering of the immolated victim, leave no repose to itself or to its tormentor: the slightest movement in the latter, is the signal of renewed agonies to the former, and is followed by reiterated cries and redoubled resistance. How is it possible under these circumstances to contemplate the natural phenomena of life? How much precaution, how much sagacity, would be requisite to obtain a solitary useful result!*

Although in the preceding observations, I have chiefly dwelt on the importance of Anatomy to the physician, you will readily anticipate me when I remark, that this science is susceptible of many other useful applications. Without its aid, the sculptor and the painter can never become eminent in their respective arts; it is, indeed, a pre-requisite to him who, in marble or on canvass, would combine harmony of proportion, expressiveness of feature, vigor in attitude, and, above all, correct muscular development.

In reference to the latter quality, I shall not soon forget the sensations I experienced on seeing a celebrated statue in the Cathedral of Milan: it represents St. Bartholomew just from the hands of his executioners; his attitude is passive, yet dignified; and his skin, which has been stripped from his body, hangs over his shoulders. The whole muscular system is consequently exposed, and the exquisite accuracy with which the sculptor has represented it, afforded me, whenever I beheld it, the utmost surprise and gratification.

It is safe to aver, that the sculptors of the Laocoon and the Apollo Belvidere, were thoroughly acquainted with muscular anatomy; and, in truth, he who is ignorant of it, can never become a good judge of the arts to which we have alluded.

* Vicq d'Azyr, Anat. du Cerveau.

To the amateur, therefore, Anatomy presents strong attractions; and to every inquisitive mind, interminable themes for inquiry and contemplation.

Peter the Great, emperor of Russia, and one of the mightiest spirits of modern times, while resident in Holland passed much of his time with the celebrated anatomist Ruysch, and, not content with the demonstrations of the lecturer, boldly seized the knife and dissected for himself.

On one point I have been long decided: it is, that when we study without enthusiasm we study to little advantage. That which we seek we must love, or our diligence and perseverance will not be commensurate with the difficulties to be encountered. "We have need of enthusiasm," says Mr. Abernethy, "some strong incentive, to induce us to spend our nights in study, and our days in the disgusting and health destroying observation of human diseases, which alone can enable us to understand, alleviate or remove them."

It is also observed by D'Israeli, that "enthusiasm inconceivably fills the mind of genius in all great and solemn operations. It is an agitation amidst calmness, and is required not only in the fine arts, but wherever a great and continued exertion of the soul must be employed."

In conclusion, therefore, let us not be dismayed by the arduous nature of our adopted pursuits. You will find many circumstances to interfere with your progress, many considerations which may for a moment tempt you to shrink from the path you are pursuing. But recollect that a professional life is a life of probation; in proportion as its duties become extended, its responsibilities increase; and the conscientious man will sometimes pause in his career, and feel a momentary impulse to forsake a vocation so replete with anxiety and self-denial. I once heard a great and good physician aver, that he had seen the time when, from professional causes, he would have rejoiced if the earth had opened and swallowed him up.

Let us now glance at the reverse: while the physician thus yields to the temporary "cloud of mind"—he is suddenly summoned to the chamber of sickness, to combat a violent disease: he at once forgets all other considerations; he invokes

the utmost powers of his art; he relieves the agonies of nature,—he restores the sick to health! How changed are his feelings! Rejoicing in the resources of his profession, and conscious of the success with which he has administered them, he now enjoys a tranquil pleasure which few situations can confer. Most other earthly emotions which I have experienced, are dust and dross to these; and he who has once experienced them, will with difficulty abandon the vocation that gave them birth. He will rather persevere with an undeviating step in the path of his adopted calling; and, though daily subjected to its vicissitudes,—though a constant witness of the frailties and sufferings of human nature, he will at last acknowledge himself, like Seneca in exile, "inter eas res beatus qui miseros solent facere."